

### **Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in this application:

#### **Listing of Claims:**

Claims 1-45 (previously canceled)

Claim 46. (currently amended) A method of inducing cell death in specific cells of a plant comprising exposing said plant to a pathogen or a chemical or allowing cell type specific expression of pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule encoding pokeweed antiviral protein wherein the protein is at least 70% homologous with the pokeweed antiviral protein selected from the group consisting of the pro-PAP-S protein of SEQ ID NO: 2, the PAP-S  $\beta$  protein of SEQ ID NO: 8, and the PAP-S  $\alpha$  protein of SEQ ID NO: 6 ; and
- (ii) an inducible promoter which induces expression of said pokeweed antiviral protein in said specific cells upon exposing of said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of said pokeweed antiviral protein induces cell death in said specific cells of said plant.

Claim 47. (currently amended) A method of inducing cell death in specific cells of a potato plant comprising exposing said plant to a pathogen or a chemical or allowing cell type specific expression of pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule as depicted in SEQ ID NO:3 encoding a mature PAP-S protein or a nucleic acid molecule that hybridizes to SEQ ID NO:3, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S protein that induces cell death; and

(ii) an inducible promoter which induces expression of said mature PAP-S protein in said specific cells upon exposure of said plant to said pathogen or said chemical or which is cell type specific, wherein expression of said mature PAP-S protein induces cell death in said specific cells of said plant.

Claim 48. (previously presented) A method of inducing cell death in specific cells of a plant comprising exposing said plant to a pathogen or said chemical or allowing cell type specific expression of pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule as depicted in SEQ ID NO:5 encoding a mature PAP-S  $\alpha$  protein or a nucleic acid molecule that hybridizes to SEQ ID NO:5, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S  $\alpha$  protein that induces cell death; and
- (ii) an inducible promoter which induces expression of said mature PAP-S  $\alpha$  protein in said specific cells upon exposure of said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of said PAP-S  $\alpha$  protein induces cell death in said specific cells of said plant.

Claim 49. (previously presented) A method of inducing cell death in specific cells of a plant comprising exposing of said plant to a pathogen or a chemical or allowing cell type specific expression of pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule as depicted in SEQ ID NO:7 encoding a mature PAP-S  $\beta$  protein or a nucleic acid molecule that hybridizes to SEQ ID NO:7, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S  $\beta$  protein that induces cell death; and

(ii) an inducible promoter which induces expression of said mature PAP-S  $\beta$  protein in said specific cells upon exposure of said plant to said pathogen or said chemical or which is cell type specific, wherein expression of said PAP-S  $\beta$  protein induces cell death in said specific cells of said plant.

Claim 50. (currently amended) A method of inducing cell death in specific cells of a plant comprising exposing of said plant to a pathogen or a chemical or allowing cell type specific expression of pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule encoding a ~~precursor-PAP~~ pro-PAP-S molecule capable of inducing cell death or a ~~precursor-PAP~~ pro-PAP-S molecule that induces cell death wherein the C-terminal region has been deleted; and
- (ii) an inducible promoter which induces expression of said mature ~~precursor-PAP~~ pro-PAP-S molecule in said specific cells upon exposure of said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of ~~precursor-PAP~~ pro-PAP-S molecule induces cell death in said specific cells of said plant.

Claim 51. (currently amended) The method of inducing cell death in specific cells of a plant according to Claim 50, wherein the ~~precursor-PAP~~ pro-PAP-S molecule is encoded for by a nucleic acid molecule as depicted in SEQ ID NO:1 or a nucleic acid molecule that hybridizes to SEQ ID NO:1, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S  $\beta$  protein that induces cell death.

Claim 52. (currently amended) The method of inducing cell death in specific cells of a plant according to Claim 51, wherein the ~~Pro-Pap-S~~ pro-PAP-S has the amino acid sequence depicted in SEQ. ID. No.: 2.

Claim 53. (currently amended) The method of inducing cell death in specific cells of a plant according to Claim 51, wherein said nucleic acid molecule encoding the ~~Pro-Pap-S~~

pro-PAP-S protein is that depicted in SEQ ID NO:1 or a sequence that hybridizes to SEQ ID NO:1, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a protein that induces cell death .

Claim 54. (previously presented) The method of inducing a cell death in specific cells of a plant according to any one of Claims 47, 48, 49, 50, 51, 52 or 53 wherein said inducible promoter is induced in pollen cells, anther cells, tapetum cells, ovule cells, cells at a nematode feeding site, cells at an abscission zone, sepal cells, carpel cells, stamen cells, trichome cells or seed cells.

Claim 55. (previously presented) A plant comprising specific cells in which a cell death effect is induced by the method of any one of Claims 46, 47, 48, 49, 50, 51, 52 or 53.

Claim 56 (canceled)

Claim 57. (previously presented) The method of Claim 46, wherein said inducible promoter is induced in pollen cells, anther cells, tapetum cells, ovule cells, cells at a nematode feeding site, cells at an abscission zone, sepal cells, carpel cells, stamen cells, trichome cells or seed cells.

Claim 58 (canceled).

Claim 59. (currently amended) A method of inducing cell death in specific cells of a plant comprising:

- a) transforming plant cells with a chimaeric gene comprising
  - (i) a nucleic acid molecule encoding a mature pokeweed antiviral protein wherein the protein is selected from the group consisting of a pro-PAP-S protein, PAP-S  $\beta$  protein, and PAP-S  $\alpha$  protein; and
  - (ii) an inducible promoter which induces expression of the mature pokeweed antiviral protein in said specific cells upon exposing said plant to a pathogen or a chemical or a promoter which is cell type specific,
- b) regenerating a plant from said transformed cells, and

- c) exposing said regenerated plant to a pathogen or a chemical or allowing cell type specific expression of a pokeweed antiviral protein in specific cells of said regenerated plant,

wherein expression of said mature pokeweed antiviral protein induces cell death in said specific cells of said regenerated plant.

Claim 60. (currently amended) A method of inducing cell death in specific cells of a plant comprising:

- a) transforming plant cells with a chimaeric gene comprising
  - (i) a nucleic acid molecule encoding a ~~precursor-PAP~~ pro-PAP-S molecule that induces cell death or a precursor ~~PAP~~ pro-PAP-S molecule that induces cell death wherein the C-terminal region has been deleted; and
  - (ii) an inducible promoter which induces expression of mature pokeweed antiviral protein in said specific cells upon exposing of said plant to a pathogen or a chemical or which is cell type specific,
- b) regenerating a plant from said transformed cells, and
- c) exposing said regenerated plant to a pathogen or a chemical or allowing cell type specific expression of a pokeweed antiviral protein in specific cells of said regenerated plant,

wherein expression of mature pokeweed antiviral protein induces cell death in said specific cells of said regenerated plant.

Claim 61. (currently amended) The method of any of claims 46-53 or 57-~~60~~ 58 wherein the pathogen is *Globodera* spp., *Heterodera* spp., *Meloidogyne* spp., or a virus.

Claim 62. (currently amended) The method of any of claims 46-53 or 57-~~60~~ 58 wherein the inducible promoter is nematode inducible.

Claim 63. (currently amended) A method of inducing cell death in specific cells of a potato plant comprising exposing of said plant to said pathogen or a chemical or allowing cell type specific expression of a pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule encoding the mature PAP-S protein of SEQ ID NO:4.; and
- (ii) an inducible promoter which induces expression of the mature PAP-S protein in said specific cells upon exposing of said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of the mature PAP-S protein induces cell death in said specific cells of said plant.

Claim 64. (previously presented) A method of inducing cell death in specific cells of a plant comprising exposing of said plant to a pathogen or a chemical or allowing cell type specific expression of a pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic molecule encoding the PAP-S  $\alpha$  protein having the amino acid sequence depicted in SEQ ID NO:6; and
- (ii) an inducible promoter which induces expression of the PAP-S  $\alpha$  protein in said specific cells upon exposing said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of said PAP-S  $\alpha$  protein induces cell death in said specific cells of said plant.

Claim 65. (previously presented) A method of inducing cell death in specific cells of a plant comprising exposing said plant to a pathogen or a chemical or allowing cell type specific expression of a pokeweed antiviral protein in specific cells of said plant, said plant comprising a chimaeric gene comprising:

- (i) a nucleic acid molecule encoding the mature PAP-S  $\beta$  protein of SEQ ID NO:8; and
- (ii) an inducible promoter which induces expression of the mature PAP-S  $\beta$  protein in said specific cells upon exposing of said plant to said pathogen or said chemical or which is cell type specific,

wherein expression of said PAP-S  $\beta$  protein induces cell death in said specific cells of said plant.

Claim 66. (currently amended) A molecule comprising (i) ~~a nucleic acid molecule encoding a mature PAP-S  $\alpha$  protein and not a mature PAP-S  $\beta$  protein~~ a nucleic acid

molecule as depicted in SEQ ID NO: 5 encoding a mature PAP-S  $\alpha$  protein or a nucleic acid molecule that hybridizes to SEQ ID NO: 5, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S  $\alpha$  protein that induces cell death; and (ii) an inducible promoter which induces expression of said mature PAP-S  $\alpha$  protein in cells of a plant upon exposing said plant to a pathogen or a chemical or which is cell type specific and induced during natural plant development.

Claim 67. (currently amended) A molecule comprising (i) ~~a nucleic acid molecule encoding a mature PAP-S  $\beta$  protein and not a mature PAP-S  $\alpha$  protein~~ a nucleic acid molecule as depicted in SEQ ID NO: 7 encoding a mature PAP-S  $\beta$  protein or a nucleic acid molecule that hybridizes to SEQ ID NO:7, in 0.5 M NaHPO<sub>4</sub>, 7% sodium dodecyl sulfate (SDS), 1mM EDTA at 65° C, and washing in 0.1X SSC/0.1% SDS at 68 ° C, and encodes a mature PAP-S  $\beta$  protein that induces cell death; and (ii) an inducible promoter which induces expression of said mature PAP-S  $\beta$  protein in cells of a plant upon exposing said plant to a pathogen or a chemical or which is cell type specific and induced during natural plant development.

Claim 68. (Currently amended) The method of Claim 46, wherein the pokeweed antiviral protein is the PAP-S  $\alpha$  protein of SEQ ID NO. 5 ~~PAP-S  $\alpha$  protein is the pokeweed antiviral protein.~~

Claim 69. (Currently amended) The method of Claim 46, wherein the pokeweed antiviral protein is the PAP-S  $\beta$  protein of SEQ ID NO: 7 ~~PAP-S  $\beta$  protein is the pokeweed antiviral protein.~~

Claim 70. (New) The method of claim 46 wherein the pokeweed antiviral protein is at least 80% homologous with the pokeweed antiviral protein selected from the group consisting of the pro-PAP-S protein of SEQ ID NO: 2, the PAP-S  $\beta$  protein of SEQ ID NO: 8, and the PAP-S  $\alpha$  protein of SEQ ID NO: 6.

Claim 71. (New) The method of claim 46 wherein the pokeweed antiviral protein is at least 90% to 95% homologous with the pokeweed antiviral protein selected from the group

consisting of the pro-PAP-S protein of SEQ ID NO: 2, the PAP-S  $\beta$  protein of SEQ ID NO: 8, and the PAP-S  $\alpha$  protein of SEQ ID NO: 6.